

Cytomorphological Pattern of Urine among Sudanese Patients with Urinary Tract Stone in Shendi Locality

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Abstract: Background: Urinary calculi can induce urothelial cellular abnormalities comparable with those of malignancy. **Aim:** To detect the Cytomorphological Pattern of Urine in Patients with Urinary Tract Stone among Sudanese patients in Shendi Locality. **Materials and methods:** This was descriptive cross-sectional study conducted in Shendi locality –River Nile State-Sudan, samples were collected from different blocks. Then the collected samples were transferred to Histopathology lab where they processed and stained. A questionnaire for collection demographic data was performed with every participant. **Results:** The cytological changes in voided urines were analysed from cases and controls, 35 urine samples were taken from each group. Cytological changes were detected in (25/35) 71.4% among cases, and (0/35) 0.00% in controls. No malignancy was seen in all samples. Dyskaryosis in urine cytology revealed that, (12/35) 34.2% of cases with dyskaryosis, while no sample of controls contain dyskaryosis. Cellular atypia was detected in (19/35) 54.2% in the cases and 0/35 0.00% in controls. Metaplasia was detected in (19/35) 54.2% in cases and 0/35 (0.00%) in controls. Features of urinary tract infection were detected in (17/35) 48.5 % in cases and (3/35) 8.57% in controls. Chronic Inflammation conditions were detected in (14/35) 40% of case, (1/35) 2.85% of controls, while acute inflammation present in (8/35) 22.8% of cases and (1/35) 2.85%. of controls. **Conclusion:** Urinary tract stone are more common in peoples live in Shendi town than people's lives in surrounding areas and Metaplasia is the most common cytological changes.

Keywords: Urinary calculi, Metaplasia, malignancy, chronic inflammation

Introduction

Stone is fragment of solid material that forms in the urinary tract, when mineral in the urine become very concentrated, small stones often pass through the body with little discomfort, but larger stones can be very painful and even block the urinary tract (1).

First sign of urinary tract stone is pain in the back belly or side, pain or burning during urination, blood in the urine, cloudy or smell urine, nausea and vomiting, fever and chills (2).

Urinary calculi can induce urothelial cellular abnormalities comparable with those of malignancy. Severe cellular changes, comparable with those of carcinoma in situ, may be seen in the epithelium adjacent to a calculus. Squamous metaplasia was frequently observed in cases with staghorn stones in the renal pelvis. The abrasive effect of the calculus may result in many multinucleated cells in the sediment. When the calculi are removed the cytological atypia and the observed multinucleation disappeared (3). Squamous cell carcinoma of the bladder in the female associated with upper and lower urinary tract stone. Increased bladder cancer risk was observed with a history of bladder stone. Several studies also showed positive associated between kidney stone and risk bladder carcinoma. In upper urinary tract cancer; abnormal cells are found in the renal pelvic, these chemicals can cause cells to change and grow out of control as cancer (4).

MATERIAL AND METHOD

This was descriptive cross-sectional study conducted in Shendi locality –River Nile State-Sudan, samples were collected from different blocks in Shendi towns, Shendi Teaching Hospital, Almak Nimer Hospitals (Hemodialysis unit), nears villages and houses. Then the collected samples were transferred to Histopathology and Cytology lab at Shendi University where they processed and stained.

Participants involved in this study were Sudanese patients with urinary tract stone enrolled as case group. Sudanese apparently healthy individuals were included as control group; both cases and control were apparently matched to each other (age, gender, residence, etc...).

For cases, patients free from stone or with stone in other part in his body were excluded in this study, for controls, patient with a disease in urinary tract or any part in his body was excluded in this study. Age race, residence and tribe were not a case in this study. Urine sample was taken from each participant to detect urine cytomorphological pattern. Seventy urine samples were taken from cases and controls, 35 urine samples were taken from each group. Simple random sampling technique was used to enrolled participants in this study. Questionnaire sheet was used to record patients data. After that, all data were gathered as codes in master sheet. Cytomorphological pattern was detected by using Papanicolaou staining method; other analytical and sociodemographic data of participants were detected using statistical analysis method. Sample collected in sterile vessels and protein, PH, blood and are estimated by strip. Then centrifuge the sample and take drop from deposit in slide, then tested under microscope by 10 \times , each sample was smeared and fixed immediately, and stained by Papanicolaou's stain. Each fixed smear was rehydrated in 90%, 70% and distilled water (D.W) 2 minutes in each. After rehydration slide was then stained in Harris's hematoxylin for 20 seconds. The smear was then blued in running tap water, then the smear was rinsed in 95%, then the smear was stained in orange G6 for 2 minutes, then the smear was washed in 95% ethanol, eosin azure 50 stains was applied for 2 minutes, then the slide was dehydrated in absolute ethanol, cleared in xylene and mounted in DPX. The smear was then screened under light microscope by the researchers and confirmed by two independent cytopathologists. Identification of cellular changes achieved by the presence of the following conditions; presence of primary criteria of malignancy (irregular chromatin pattern, chromatin strands of unequal size and shape, condensation of large chromatin clumps at nucleus border unevenly leaving empty center) to indicate cancer cells, presence of dyskaryotic cells (malignant chromatin with normal amount of cytoplasm), presence of secondary criteria of malignancy to indicate cellular atypia (hyperchromasia, increase amount of chromatin, enlarged cells and nuclei, multinucleation, irregular nuclear border, presence of mitotic figures, abnormal enlarged and multinucleoli), cellular changes also identified by the presence of metaplastic cells in urine, presence of keratosis (para and hyperkeratosis). Acute inflammatory change identified by the presence of neutrophilia, while chronic inflammation identified by the presence of lymphocytosis and macrophages.

Sterile disposable urine containers were used to collect the samples, also each sample were concentrated 3times by adding urine from the residual of the same sample to the deposit to obtain more cells, also the working solutions and the working procedures were checked first before use. Urine sample with UTI was used for this check points .Data were computed and analyzed by using Statistical Package for Social Sciences (SPSS) software program; version (21.0). The means were obtained and chi square test was used for comparison, other variables and frequencies were calculated and presented in forms of figures and tables.

The study was approved from the department of Histopathology and Cytology in Medical Laboratory Sciences at Shendi University (Sudan), the study was met the ethical review committee board. Sample collection was done after signs a written agreement with the participants. Permission of this study was obtained from the local authorities in the area of study. The aims and the benefits of this study were explained with the assurance confidentiality.

RESULTS

The age of patients ranged from 10-70 years old with average mean of age 35 years old. The age of patients subgroup into three groups, group one included patients with 10- 30 years old, group two with 31-50 years old, the last age group of those with age 51-70 years old as showed in figure (1).

The gender among this study divided into 65.7% (23/35) females and 34.2% (12/35) males ,figure (2).

Regarding the marital status among study group, 51.4 % (18/35) were single and 48.5% (17/35) were married, figure (3).

Regarding water source, 64.7% (23/35) of people drinking of water from wells sources and 34.2% (12/35) people drinking water from rivers source as indicated in figure (4).

Regarding duration of urinary tract stone among cases, duration was subgroups into 5,group one (1 month- 5 year's) (27/35) 77.1%, second group was those with duration of (6- 10 years) (5/35) 14.2%, in third group was those with duration of (1/35) 2.8%, the fourth group was those with duration (16 -20 years) (1/35) 2.58% and the last group was those with duration of (26 -30 years) (1/35) 2.85%, as indicated in table (1).

In respect to anatomical site of stone among population in study included (23/35) 65.7% of patients present with kidney stone, (11/35) 31.4% of patients present with urethral stone and (1/35) 2.85%.of patients present with kidney and urethral stone ,table (2).

In respect to the incidence of urinary tract stone among cases, (18/35) 51.4% of cases present with recurrent urinary stone, while the remainders (17/35) 48.5% of cases were diagnosed with urinary tract stone as the first time as illustrated in table (3).

Presence of hematuria among study groups, (5/35) 14.8% of cases present with blood in their urine and (30/35) 85.7% their urine free from blood, all urine samples from control group found free of hematuria, the p.value was 0.07 , table (4).

Proteinuria was present in (8/35) 22.8%, while none of control samples were present with protein in urine; the p.value was 0.00 as showed in table (5).

Regarding presence of salts and crystals, (27/35) 77.1%of urine from cases present with salts and crystals, while all 35urine from controls were negative, the p.value was 0.00,table (6), (1/35) 2.85%of cases sample with calcium oxalate, (2/35) 5.71% with calcium carbonate, (8/35) 22.8 % with trible phosphate, (9/35) 25.7% with amorphous urate, (4/35) 11.4% with amorphous phosphate, (2/35) 5.71% with tyrosin, (1/35) 2.85% with uric acid and (8/35) 22.8% samples without present of salts was indicated , table (7).

Regarding pH degree in urine among study groups, acid pH in (21/35) 60%, alkaline pH in 10/35 (28.5%) and neutral pH recorded in (4/35) 11.4% cases .while distribution of pH among controls showed, the acid was detected in 31/35 (88.5) %, alkaline pH in 3/35 (8.5%) neutral pH observed in 1/35(%2.8) the p.value was 0.03 , table (8).

Presence of pus cells in urine among study groups indicated that, pus cells present in (20/35) 57.1% and 2/35(%) among cases and controls respectively the p .value was 0,00 , table (9).

Presence of epithelial in urine among study groups indicated that, epithelial were present in (3/35) 8.57%and 1/35 (%) among cases and controls respectively with p.value of 0.16 as indicated in table (10).

Regarding cytology pattern in urine from cases and controls cytological changes were detected in (25/35) 71.4% among cases, and (0/35) 0.00% in controls with the p.value 0.00 with presence of change as illustrated in table (11).

Regarding incidence of malignancy among cases and control, not all samples contain malignant cells as showed in table (12).

Presence of dyskaryosis in urine cytology revealed that, (12/35) 34.2% of cases with dyskaryosis, while non-sample of controls contain dyskaryosis condition with the p.value 0.00 as revealed in table (13).

Cellular atyia was detected in (19/35) 54.2% in the cases and 0/35 0.00% in control the p.value was 0.00 as detected in table (14).

Metaplasia was detected in (19/35) 54.2% in cases and 0/35 (0.00%) in control, the p.value was 0.00 as showed in table (15).

Features of urinary tract infection were detected in (17/35) 48.5 % in cases and (3/35) 8.57% in controls with the p.value 0.00 as illustrated in table (16).

Keratosi was present in (7/35) 20% of cases and (2/35) 5, 71% of controls without with the p.value of 0.101as indicated in table (17).

Chronic Inflammation conditions were detected in (14/35) 40%of case, (1/35) 2.85% of controls, while acute inflammation present in (8/35) 22.8% of cases and (1/35)2.85%.of control, the p.value was 0.00 as present in table (18).

Regarding family history of urinary tract stone among cases (21/35) 60% with family history of these stone, while 2/35 (5.71. %) of control said they have had family history of urinary tract stone with the p.value 0.00 as illustrated, and (14/35) 40% of cases without family history was detected as showed in table (19).

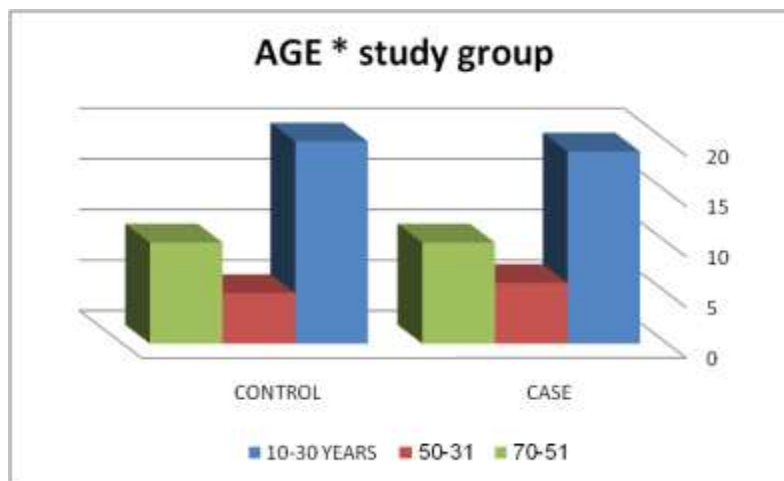


Figure (1): Indicates frequency of age among cases and control.

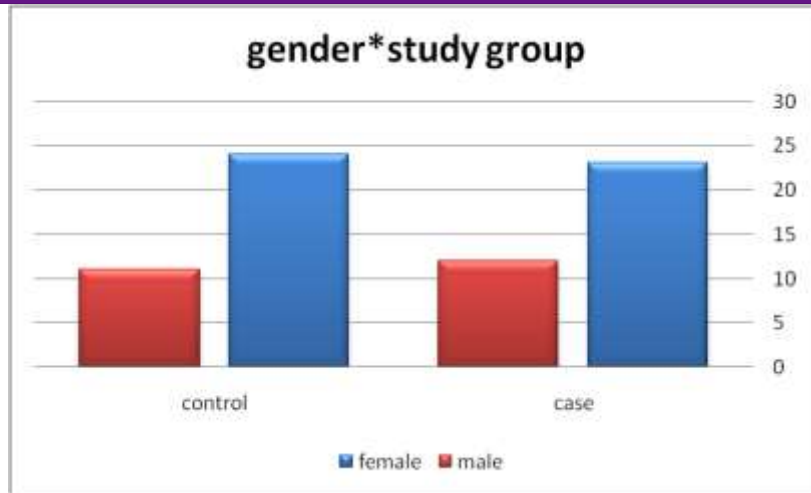


Figure (2): Indicates frequency of gender among study groups.

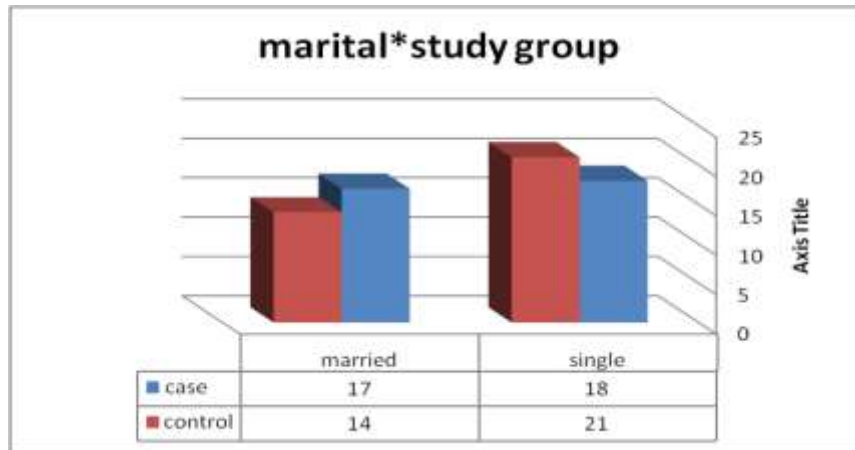


Figure (3): Indicates marital status among study groups.

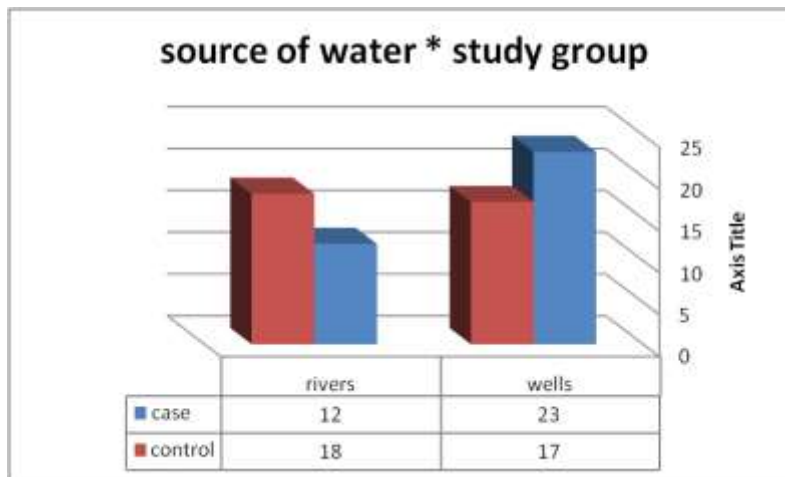


Figure (4): Indicates frequency of source of water.

Table (1): Frequency of duration of urinary tract stone among cases.

| S t o n e | S t u d y g r o u p | | P . v a l u e |
|---------------------------|---------------------|------------|---------------|
| | C a s e | | |
| | Frequency | Percentage | |
| 1 m o n t h - 5 y e a r s | 2 7 | 7 7 . 1 % | 0 . 0 0 |
| 6 - 1 0 y e a r s | 5 | 1 4 . 8 % | |
| 1 1 - 1 5 y e a r s | 1 | 2 . 8 % | |
| 1 6 - 2 0 y e a r s | 1 | 2 . 8 % | |
| 2 1 - 2 5 y e a r s | 0 | 0 % | |
| 2 6 - 3 0 y e a r s | 1 | 2 . 8 % | |
| h a v e n o t s t o n e | 0 | 0 % | |
| T o t a l | 3 | 5 | |

Table (2): Frequency regarding anatomical site of urinary tract stone.

| Anatomical site for stone position | K i d n e y | S t u d y g r o u p | | P . v a l u e |
|------------------------------------|---------------------------------|---------------------|------------|---------------|
| | | C a s e | | |
| | | Frequency | Percentage | |
| U r e t h r a | K i d n e y a n d u r e t h r a | 2 3 | 6 5 . 7 % | 0 . 0 0 |
| | | 1 1 | 3 1 . 4 % | |
| | | 1 | 2 . 9 % | |
| T o t a l | 3 | 5 | | |

Table (3): Frequency of incidence of urinary tract stone.

| Incidence of urinary tract stone | Y e s | S t u d y g r o u p | | P . v a l u e |
|----------------------------------|-------|---------------------|------------|---------------|
| | | C a s e | | |
| | | Frequency | Percentage | |
| N o | N o | 1 8 | 5 1 . 4 % | 0 . 0 0 |
| | | 1 7 | 4 8 . 6 % | |
| T o t a l | | 3 | 5 | |

Table (4): Presence of hematuria among cases and control.

| Presence of blood in urine | Y e s | S t u d y g r o u p s | | | | P . v a l u e | |
|----------------------------|-------|-----------------------|------------|---------------|------------|---------------|-----|
| | | C a s e | | C o n t r o l | | | |
| | | Frequency | Percentage | Frequency | Percentage | | |
| N o | N o | 5 | 1 4 . 2 % | 0 | 0 % | 0 . 0 7 | |
| | | 3 0 | 8 5 . 8 % | 3 5 | 1 0 0 % | | |
| T o t a l | | 3 | 5 | 3 | 5 | | 7 0 |

Table (5): Presence of proteinuria in cases and controls.

| Presence of protein in urine | Y e s | S t u d y g r o u p | | | | P . v a l u e | |
|------------------------------|-------|---------------------|------------|---------------|------------|---------------|-----|
| | | C a s e | | C o n t r o l | | | |
| | | Frequency | Percentage | Frequency | Percentage | | |
| N o | N o | 8 | 2 2 . 9 % | 0 | 0 % | 0 . 0 0 | |
| | | 2 7 | 7 7 . 1 % | 3 5 | 1 0 0 % | | |
| T o t a l | | 3 | 5 | 3 | 5 | | 7 0 |

Table (6): Presence of salts in urine among cases and controls.

| | | S t u d y g r o u p | | | | P.value |
|----------------------------|-----|---------------------|------------|---------------|------------|---------|
| | | C a s e | | C o n t r o l | | |
| | | Frequency | Percentage | Frequency | Percentage | |
| Presence of salts in urine | Yes | 2 7 | 7 7 . 1 % | 0 | 0 % | 0 . 0 0 |
| | No | 8 | 2 2 . 9 % | 3 5 | 1 0 0 % | |
| T o t a l | | 3 | 5 | 3 | 5 | 7 0 |

Table (7): Frequency of chemical types of stone.

| | | S t u d y g r o u p | | | | P.value |
|---------------------------|-------------------------------------|---------------------|------------|---------------|------------|---------|
| | | C a s e | | C o n t r o l | | |
| | | Frequency | Percentage | Frequency | Percentage | |
| Presence of salt in urine | C a o x a l a t e | 1 | 2 . 8 % | 0 | 0 % | 0 . 0 0 |
| | C a c a r b o n a t e | 2 | 5 . 7 % | 0 | 0 % | |
| | T r i b l e p h o s p h a t e | 8 | 2 2 . 8 % | 0 | 0 % | |
| | A m o r p h o u s u r a t e | 9 | 2 5 . 9 % | 0 | 0 % | |
| | A m o r p h o u s p h o s p h a t e | 4 | 1 1 . 7 % | 0 | 0 % | |
| | T y r o s i n | 2 | 5 . 7 % | 0 | 0 % | |
| | U r i c a c i d | 1 | 2 . 8 % | 0 | 0 % | |
| | A b s e n t | 8 | 2 2 . 8 % | 3 5 | 1 0 0 % | |
| T o t a l | | 3 | 5 | 3 | 5 | 7 0 |

Table (8): The pH degree in urine among cases and controls.

| | | S t u d y g r o u p | | | | P.v a l u e |
|-----------|-----------------|---------------------|------------|---------------|------------|-------------|
| | | C a s e | | C o n t r o l | | |
| | | Frequency | Percentage | Frequency | Percentage | |
| p H | A c i d i c | 2 1 | 6 0 % | 3 1 | 8 8 . 6 % | 0 . 0 3 |
| | A l k a l i n e | 1 0 | 2 8 . 5 % | 3 | 8 . 6 % | |
| | N e u t r a l | 4 | 1 1 . 5 % | 1 | 2 . 8 % | |
| T o t a l | | 3 | 5 | 3 | 5 | 7 0 |

Table (9): Presence of pus cells in urine among cases and control.

| | | S t u d y g r o u p | | | | P.value |
|--------------------------|-----|---------------------|------------|---------------|------------|---------|
| | | C a s e | | C o n t r o l | | |
| | | Frequency | Percentage | Frequency | Percentage | |
| Presence of pus in urine | Yes | 2 0 | 5 7 . 1 % | 2 | 5 . 7 % | 0 . 0 0 |
| | No | 1 5 | 4 2 . 9 % | 3 3 | 9 4 . 3 % | |
| T o t a l | | 3 | 5 | 3 | 5 | 7 0 |

Table (10): Presence of epithelial cells in urine among cases and control.

| | | S t u d y g r o u p | | | | P.v a l u e |
|---------------------------------------|-----|---------------------|------------|---------------|------------|-------------|
| | | C a s e | | C o n t r o l | | |
| | | Frequency | Percentage | Frequency | Percentage | |
| Presence of epithelial cells in urine | Yes | 3 | 8 . 5 % | 1 | 2 . 8 % | 0 . 1 6 |
| | No | 3 2 | 9 1 . 5 % | 3 4 | 9 7 . 2 % | |
| T o t a l | | 3 | 5 | 3 | 5 | 7 0 |

Table (11): Cytological pattern in urine among cases and control.

| | | S t u d y g r o u p | | | | P.value |
|--------------------------------------|-----|---------------------|------------|---------------|------------|---------|
| | | C a s e | | C o n t r o l | | |
| | | Frequency | Percentage | Frequency | Percentage | |
| Presence of change in urine cytology | Yes | 2 5 | 7 1 . 5 % | 0 | 0 % | 0 . 0 0 |
| | No | 1 0 | 2 8 . 5 % | 3 5 | 1 0 0 % | |
| T o t a l | | 3 5 | | 3 5 | | 7 0 |

Table (132): Frequency of malignant cells in urine among cases and control.

| | | S t u d y g r o u p | | | | P.value |
|--|-----|---------------------|------------|---------------|------------|---------|
| | | C a s e | | C o n t r o l | | |
| | | Frequency | Percentage | Frequency | Percentage | |
| Presence of malignant cell in urine cytology | Yes | 0 | 0 % | 0 | 0 % | 0 . 0 0 |
| | No | 3 5 | 1 0 0 % | 3 5 | 1 0 0 % | |
| T o t a l | | 3 5 | | 3 5 | | 7 0 |

Table (13): Frequency of suspect of malignancy cells in urine among cases and control.

| | | S t u d y g r o u p | | | | P.value |
|--------------------------------------|-----|---------------------|------------|---------------|------------|---------|
| | | C a s e | | C o n t r o l | | |
| | | Frequency | Percentage | Frequency | Percentage | |
| Suspect of malignancy cells in urine | Yes | 1 2 | 3 4 . 3 % | 0 | 0 % | 0 . 0 0 |
| | No | 2 3 | 6 5 . 7 % | 3 5 | 1 0 0 % | |
| T o t a l | | 3 5 | | 3 5 | | 7 0 |

Table (14): Frequency of cellular atypia in urine among cases and control.

| | | S t u d y g r o u p | | | | P.value |
|--------------------------------------|-----|---------------------|------------|---------------|------------|---------|
| | | C a s e | | C o n t r o l | | |
| | | Frequency | Percentage | Frequency | Percentage | |
| Presence of atypia in urine cytology | Yes | 1 9 | 5 4 . 2 % | 0 | 0 % | 0 . 0 0 |
| | No | 1 6 | 4 5 . 8 % | 3 5 | 1 0 0 % | |
| T o t a l | | 3 5 | | 3 5 | | 7 0 |

Table (15): Frequency of metaplasia in urine among cases and control.

| | | S t u d y g r o u p | | | | P.value |
|--|-----|---------------------|------------|---------------|------------|---------|
| | | C a s e | | C o n t r o l | | |
| | | Frequency | Percentage | Frequency | Percentage | |
| Presence of metaplasia in urine cytology | Yes | 1 9 | 5 4 . 2 % | 0 | 0 % | 0 . 0 0 |
| | No | 1 6 | 4 5 . 8 % | 3 5 | 1 0 0 % | |
| T o t a l | | 3 5 | | 3 5 | | 7 0 |

Table (16): Frequency of urinary tract infection among cases and control.

| | | S t u d y g r o u p | | | | P.value |
|---|-----|---------------------|------------|---------------|------------|---------|
| | | C a s e | | C o n t r o l | | |
| | | Frequency | Percentage | Frequency | Percentage | |
| Presence of infection in urine cytology | Yes | 1 7 | 4 8 . 5 % | 3 | 8 . 6 % | 0 . 0 0 |
| | No | 1 8 | 5 1 . 5 % | 3 2 | 9 1 . 4 % | |
| T o t a l | | 3 5 | | 3 5 | | 7 0 |

Table (17): Frequency of keratosis among cases and control.

| | | S t u d y g r o u p | | | | P . v a l u e |
|---|-----|---------------------|------------|---------------|------------|---------------|
| | | C a s e | | C o n t r o l | | |
| | | Frequency | Percentage | Frequency | Percentage | |
| Presence of keratosis in urine cytology | Yes | 7 | 4 8 . 5 % | 2 | 5 . 7 % | 0 . 1 0 1 |
| | No | 2 8 | 5 1 . 5 % | 3 3 | 9 4 . 3 % | |
| T o t a l | | 3 | 5 | 3 | 5 | 7 0 |

Table (18): Presence of inflammation in urine among cases and control.

| | | S t u d y g r o u p | | | | P . v a l u e |
|--|-----------------|---------------------|------------|---------------|------------|---------------|
| | | C a s e | | C o n t r o l | | |
| | | Frequency | Percentage | Frequency | Percentage | |
| Presence of inflammation in urine cytology | C h r o n i c | 1 4 | 4 0 % | 1 | 2 . 8 % | 0 . 0 0 |
| | A c u t e | 8 | 2 2 . 8 % | 1 | 2 . 8 % | |
| | No inflammation | 1 3 | 3 7 . 2 % | 3 3 | 9 4 . 4 % | |
| T o t a l | | 3 | 5 | 3 | 5 | 7 0 |

Table (19): Family history of urinary tract stones among cases and control.

| | | S t u d y g r o u p | | | | T o t a l | P . v a l u e |
|---------------------------------------|-------|---------------------|------------|---------------|------------|-----------|---------------|
| | | C a s e | | C o n t r o l | | | |
| | | Frequency | Percentage | Frequency | Percentage | | |
| Family history of urinary tract stone | Y e s | 2 1 | 6 0 % | 2 | 5 . 7 % | 2 3 | 0 . 0 0 |
| | N o | 1 4 | 4 0 % | 3 3 | 9 4 . 3 % | | |
| T o t a l | | 3 | 5 | 3 | 5 | 7 | 0 |

4. DISCUSSION

Seventy samples were enrolled in this cross sectional study, 50 % of them with urinary tract stone and other 50 % were apparently healthy individuals, both cases and control were with similar criteria except in having disease, this study aimed to detect cytomorphological pattern of patient with urinary tract stone in Shendi locality.

The age play important factor in the prevalence renal stone (5), the average mean of age of patients with urinary tract stone was 35 years old. insignificant statistical in population based cross sectional survey study concluded in USA concluded that ;of 15.364 USA residents from Two third of patient the age play important factor in the prevalence of renal stone, USA residents from 1976-1994 :the incidence begins to rise after age 20 and peaks between ages 40-60 also in this study conducted by urology health organization they summarized that; the average mean of age of patient with urinary tract stone was 48 years old (6) similar age result present in Sudanese study performed in Suba Teaching Hospital and Ibn Sina Hospital conducted by Abdulla et al, who summarized that; the average mean of age of patient urinary tract stone was 34.2 years old (7).

Regarding the patient gender our study found that; two thirds of patients with urinary tract females and one third was male, incidence rates of kidney stone, very by age, sex, race(6),in previous study performed in Suba Teaching Hospital and Ibn Sina Hospital conducted by Abdalla et al, and concluded that insignificant statistical predominant gender of patients with urinary tract stone were males with percentage 58.9%while females were 41.1%in another study conducted by pearle et al they summarized that ; kidney stones typically affect men approximately 2 to 3 times more frequently than women (8),these study opposite to our study may be due to the variation in time when our samples being collected meet females more than males.

Regarding the residence among case group; approximately 2/3 of patient came from Shendi town (center) approximately 1/3 of cases from northern Shendi while the reminders cases from southern Shendi, and this may be due centralization of services in Shendi town in comparison to other regional in Shendi locality. No Published study in Shendi locality or River Nile State that conducted urinary tract stone and insignificant statistical.

Literature said, geography represented the main extrinsic factors insignificance in which prevalence of renal stones is higher in tropical areas ,renal stone in South Korea is 3.5% but in Taiwan my reach to 9.6% climatic and seasonal also poly important role in stones incidence. Large amount bicarbonate and calcium increased formation calcium bicarbonate stone (9), in USA study conducted by Stamatelou et al reported that; geographic distribution of kidney stone formation has been widely reported, with areas

of hot or dry climates, such as desert or tropical areas, showing increased prevalence. Soucio et al showed increased prevalence in United States from north to south and west to east, with highest prevalence being in southeast (9).

Regarding the duration of urinary tract stone among cases, our result revealed that; significant three quarters of cases their stones last one year and less in study conducted by urology health organization they summarized that; the urinary tract stones symptoms last for more than five years (10).

In respect to Anatomical site of urinary tract stone, we found significant statistical difference; three patients had renal stone, similar findings obtained Urine Cytology in a Tertiary Care Center in USA Who concluded by vikram Deshpande and his colleagues (11).

In respect to this incidence state of urinary tract stone among cases, more than 50% of cases present with results indicated that; there was significant statistical difference recurrent urinary tract stone, Sudanese study performed in Suba University hospital and Ibn Sina Hospital, they concluded that; among 113 patients 39 experienced recurrent renal stone (7).

Regarding correlation of Presence of blood and protein in cases and control, our results indicated that; there was significant statistical difference, hematuria and protein among case group in about 20% of patients while no from control group present with these symptoms, in study performed by Nicolle; who concluded that; chemical examination reveals hematuria but latter stage disappear and protein observed in 5 cases from patients (5).

Regarding the presence of salts and crystals in urine and chemical subtype of stone among case, our results showed that London salt and crystal present in more than third quarter, other study discussed by Silvwho concluded that: the chemical analysis of urine of patient suffering from renal stone, reported was predominantly calcium oxalate more than 80%, but urate and uric acid less than 10% (12).

Regarding pH degree of urine among study groups, acid in pH predominant in the both group, but alkaline pH was predominant with statistical significance difference and this typically due to occurrence of stones, other study by urology organization alkaline pH of the patient excretion of Cystine leads to stone formation stones because it is solubility in the very low under normal urine pH, and specific gravity of the urine show higher than normal range (10).

Presence of pus cell in urine among study groups; there was significant statistical difference that, pus cell present in more than half cases, while 2 out of control showed pus cell, in study showed by; Nicolle; he concluded that; microscopic finding showed increased pus cell in patients with urinary tract stone (13).

Presence of epithelial urine among study groups, indicate that epithelial present in trace amount abnormally, other study by department pathology; in St Peter's Hospitals in London found more than half of urines from patients in London with calculi there were no significant epithelial abnormalities (3).

Regarding cytology pattern in urine from cases and control cytological change were detected in more than third quarter among case, The study reported by Department of Pathology, St Peter Hospital in London showed that in more than half urines from patients calculi showed no significant epithelial abnormalities. When these were present, the majority could be clearly recognized as being non-malignant by the uniformity of nuclear size, shape, and staining in both the single and smooth bordered clusters of transitional cells (3).

Regarding incidence of malignancy, all sample not contain malignancy, but In Beyer-Boon's paper urines From the Department of Pathology, St Peter's Hospitals and Institute of Urology in London from 11 out of 62 calculus cases were reported as showing significance cytological features of malignancy; 9 were stated to be compatible with grade 2 carcinoma (differentiated) and 2 with grade 3 carcinoma (intermediate differentiation) a the abnormal cells disappeared after removal of the calculi (3).

Presence of suspect of malignancy in urine cytology revealed that, third of cases with suspect of malignancy, From the Department of Pathology, St Peter's Hospitals and Institute of Urology in London, Epithelial hyperplasia and severe significance with atypia features similar to those in the sheets of transitional cells demonstrated one patient with renal calculi (3).

Cellular atypia was detecting in more than half of cases, Histological examination of urothelium adjacent to calculi in eight patients showed no evidence of malignancy but showed severe epithelial atypia. Other study From the Department of Pathology, St Peter's Hospitals in London Atypia: 63 patients. The cytological feature characteristic of all the 78 urines in this group was significant statistical difference clusters of transitional cells with smooth borders. The clusters were rounded Calculus atypia (3).

Metaplasia was detected in two third of cases, with zero results detect in control, other study From the Department of Pathology, St Peter's Hospitals and Institute of Urology in London showed Histological examination of the adjacent urothelium revealed metaplasia, ulceration, calcification and regeneration but no evidence of malignancy. In addition, the third there was partial replacement of urothelium by granulation tissue while the remaining urothelium showed features of squamous metaplasia and hyperplasia (3).

Feature of urinary tract infection was detected in fifty of cases, other study was significant by urology organization during seven years (1975-1981) a total of 1325 patients hospitalized for stone disease were studied as to occurrence of positive urine culture positive urinary cultures, E.coli most common followed by proteus there was a higher frequency magnesium ammonium phosphate, analysis of patient with urinary calculi, Candida albicans in the kidney may affect 10% of people during childhood (10).

Presence keratosis in urine cytology less than quarter, Histological examination showed insignificance of urothelium adjacent to calculi in Department of Pathology, St Peter's Hospitals and Institute of Urology in London, patients showed no evidence of malignancy although one case showed hyperplasia and severe epithelial atypia and not showed keratosis (3).

Inflammation in urine was observed in third of cases, between chronic and acute, study significance in health line organization, inflammation caused by urinary tract infection or radiation therapy can lead to stone (13).

In family history about two third was detected in case group, other study in Soba University Hospital and Ibn Sina university reported that the role of positive family history was their significance different in the pathogenesis of urolithiasis and the prevalence of recurrence, after excluding Cystine and uric acid stone former found that 20% of those with calcium oxalate stone attending the clinic have first degree relative with a history of stone, Resnick et al found that family history of stone in about 14% of calcium stone former, our findings was in agreement with that, but the fact that renal stone formation runs in certain families. Genetic is an important intrinsic risk factor for renal stone which its prevalence may reach to 25% of patients with kidney stones in which the family history (7).

CONCLUSION

From the obtained results, we concluded that:

1. The young adult age is the most affected age with urinary tract stone.
2. Females with urinary tract stone are two folds more than males with urinary tract.
3. Urinary tract stone are more common among peoples live in Shendi town than people's lives in surrounding areas.
4. Urinary tract stone are doubling in peoples whom drinking waters from wells than those who are drinking water from river.
5. Seventy five percent of urinary tract stone was renal stone.
6. Metaplasia is the most common cytological changes among study population.
7. No malignancy is found among the studied cases.

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